Info-Hams Digest   Thu, 25 Mar 93   Volume 93 : Issue 376

Today's Topics:
                $40.00 Radio Shack SWR meter problems (2 msgs)
                        20 ma Current loop specs
                   Boy, this can turn me off! (2 msgs)
                            Daylight time
               Kenwood cw filter (and incorrect offset)
                  Nicad Memory Effect-Fact or Myth?
                  no-coders, <deleted> of the earth
               RFD: reorganization of rec.radio.amateur

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Thu, 25 Mar 1993 16:41:00 GMT
From: news.acns.nwu.edu!casbah.acns.nwu.edu!lapin@network.UCSD.EDU
Subject: $40.00 Radio Shack SWR meter problems
To: info-hams@ucsd.edu

In article <1993Mar24.203928.2616@mixcom.com> mei.mon <mei.mon@mixcom.mixcom.com>
writes:
>I recently went to AES here in Milwaukee to by a tiny, hand-held
>2m/70cm band SWR meter made by Commet. AES had it for around $70.00.
>
>They were out, so the salesman said Radio Trash had the same one (with
>the RS logo) for only $40.00. Well they did, so I bought it. However,
>it appears to be WAY OFF.
>
>I plugged in my Alinco DJ580T running at 5 watts on 446 MHz and tested

>SWR and power output into my Cushcraft mag-mount mobile. Radio Shack's
>little dream machine said SWR was only 1.1 (okay maybe it IS that good)
>and that power output was 12 Watts! I know for sure that the DJ580 does
>NOT put out 12 watts! Does anyone else out there have experience with this
>thing (or the Commet version)?
>
>Also, this little wonder has NO calibration pots for SWR! How accurate
>can it be? I thought the proceedure was to transmit (while zeroing the meter)
>and then transmit agin and read the SWR. This thing just has two switches,
>one for 15 or 50 watts full scale, and another for SWR or POWER.
>
>--
>Kevin Jessup, N9SQB

If this is the swr meter that I have seen, it has a correction factor plot
on the back to correct the "SWR" reading when the transmitter is not
putting out enough power to give a full scale forward reading. I never
thought that this scheme was very accurate.

Greg Lapin KD9AZ
glapin@nwu.edu

Date: Thu, 25 Mar 1993 16:51:37 GMT
From: sdd.hp.com!hpscit.sc.hp.com!icon.rose.hp.com!lkraft@network.UCSD.EDU
Subject: $40.00 Radio Shack SWR meter problems
To: info-hams@ucsd.edu

Bob Witte (bobw@col.hp.com) wrote:
: >In article <1993Mar24.203928.2616@mixcom.com> you write:
: >> I plugged in my Alinco DJ580T running at 5 watts on 446 MHz and tested
: >> SWR and power output into my Cushcraft mag-mount mobile. Radio Shack's
: >> little dream machine said SWR was only 1.1 (okay maybe it IS that good)
: >> and that power output was 12 Watts! I know for sure that the DJ580 does
: >> NOT put out 12 watts! Does anyone else out there have experience with this
: >> thing (or the Commet version)?
: >>
: >> Also, this little wonder has NO calibration pots for SWR! How accurate
: >> can it be? I thought the proceedure was to transmit (while zeroing the
meter)
: >> and then transmit agin and read the SWR. This thing just has two switches,
: >> one for 15 or 50 watts full scale, and another for SWR or POWER.
: >>
: > I've got one of these little meters and with casual comparison to a higher
: > quality measuring device, I'd say it basically works.
: >
: > As far as zeroing the meter... if you read the instructions they will

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: >  explain that there is a SWR correction chart on the back of the meter.
: >  (You have to correct the SWR reading based on the measured power.)
: >  Not real convenient, but avoids the need for a switch and adjustment.
: >

    I believe there is also a minimum power level required to be able
    even USE the SWR feature, but I don't recall what that level is
    offhand. Something like 10 Watts on the 15 Watt scale.

    I've compared the readings against an HP435A/8482H power meter,  and
    the readings are reasonable given the low cost.

    L


 =============================================================================
                                Lyle Kraft                AA6LK
 ###################         Hewlett-Packard
 ######  /_  _   ######      System Interconnect Lab -
 #####  / / /_/   #####         Information Networks Division
 ######    /      ######      Roseville, CA 95747
 #####################        916-785-5798
                              lkraft@core.rose.hp.com
 =============================================================================


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Date: 25 Mar 1993 15:31:54 GMT
From: usc!zaphod.mps.ohio-state.edu!saimiri.primate.wisc.edu!
usenet.coe.montana.edu!news.u.washington.edu!carson.u.washington.edu!
whit@network.UCSD.EDU
Subject: 20 ma Current loop specs
To: info-hams@ucsd.edu

In article <C4Ar8C.K8E@eskimo.com> mann@eskimo.com (Tom Mann) writes:
>Well, no one gave me a circuit for interfacing RS-232 to 20 ma current loop
>so it looks like I have to design my own. Can anyone tell me what 20 ma current
>loop 'looks' (voltage level, impedance, etc) like?
>
>Tom "Old" Mann KD9NL/7 Kirkland, Wash.

    20 mA output from the old ASR33's was a 90V DC supply and
a limiting resistor (tapped for either 20 mA or 60 mA).  The receiver
was a low-impedance relay coil, and polarity was considered irrelevant.

    Some 20 mA interfaces try to use 12V, but those are less
reliable (90V will burn through lots of crud on the connections
where 12V doesn't operate).
```

Typical receivers nowadays for 20 mA are just optoisolators
with full-wave bridge rectifiers (so the input polarity can be
arbitrary), and typical sending is by 12V/resistor/switch to GND.
It would be preferable to use +/- 12V (or higher voltage, if
available) with a transistor current source.

        John Whitmore

Date: Thu, 25 Mar 1993 15:45:28 GMT
From: usc!zaphod.mps.ohio-state.edu!uwm.edu!linac!newsaintmail@network.UCSD.EDU
Subject: Boy, this can turn me off!
To: info-hams@ucsd.edu

In article <N4HY.93Mar25085736@tang.ccr-p.ida.org>, n4hy@tang.ccr-p.ida.org (Bob
McGwier) writes:
>
> Ignore all this hullabaloo. The people on this are NOT representative of
> amateurs (thank goodness). On here you will find some of the best and
> the worst but what you will mostly find is a bunch of cowards who are
> willing to say things with their keys that they would NEVER say to you
> in person or on the air.
>
> Bob

Bob, that's not the issue. While 'they' might not express their opinions in
person or on the air, that's still the way they feel. I was talking to someone
whos name or callsign I'll not mention, on the air recently. The conversation
went well, until the subject of no-code came up. As soon as he found out that
I was one of those no-coders, he suddenly got quiet, and then had something
else to do. Now, it's possible that he really had to go, but the timing was
quite uncanny.

==
[Mark E. Levy, Fermilab |]
[BitNet: LEVY@FNAL | Unix is to computing   ]
[Internet: LEVY@FNALD.FNAL.GOV | as an Etch-a-Sketch is to art.   ]
[HEPnet/SPAN: FNALD::LEVY (VMS!) |]
==

Date: Thu, 25 Mar 1993 17:15:41 GMT
From: pa.dec.com!nntpd2.cxo.dec.com!nuts2u.enet.dec.com!little@decwrl.dec.com
Subject: Boy, this can turn me off!
To: info-hams@ucsd.edu

Let me add that in 1.5 years of operating (most of it as a simple
technician class licensee) that I've never once received grief on the air.
In fact, the only rude thing I've had happen on the air was some guy in
New York blew me off on making a 2 meter Aurora contact because I couldn't
copy his call sign at the speed he was sending it. Here in Chicago, I've
never even heard a single derogatory comment made about technicians on the
air.

Now face to face and in the newsgroup are a different matter. The flamers
in this newsgroup are some mutant faction that should just be ignored. The
rare OF you meet face to face at hamfests is also best ignored. Like any
segment of society, you get some bad with the good.

Ask the ARRL to send you their new ham information packet and contact some
local clubs. I'm sure they would welcome you with open arms and plenty of
assistance.

73 and hope to hear you on the air!
Todd
N9MWB

Date: Thu, 25 Mar 1993 16:37:24 GMT
From: sdd.hp.com!col.hp.com!news.dtc.hp.com!hpscit.sc.hp.com!icon.rose.hp.com!
bpicon@network.UCSD.EDU
Subject: Daylight time
To: info-hams@ucsd.edu

Derek Wills (oo7@emx.cc.utexas.edu) wrote:
: Ahem - it is Daylight Saving Time, not Savings. Savings is OK
: in Fidelity Savings and Loan, but you save daylight, you don't
: saves it.

: Don't nobody know nuffink?   Or could they care less (ouch!)?
:
: Derek "spelling checked while you wait" Wills (AA5BT, G3NMX)

I never knew this... and I checked my dictionary, and you are exactly
correct!

What's funny about this, was that when I was a little tyke (say 5
years old), we lived in Dallas, and my grandparents lived in Illinois.
I had learned to call the time recording at the Republic National bank
in Dallas (I think it was RIverside 1-6651, but my memory may be clouded
at this point). Well, anyway, they had Daylight Saving Time in Chicago,

but not in Dallas at that time, and when my parents told me that the
time was different in Chicago since they were on Daylight Saving(s) time
(my parents said it this way), I assumed that in Chicago, you called
"Daylight Savings" (and loan association or whatever) to get the
time, and their clock was different. It wasn't until we moved to
California in 1961 that I got the story straightened out.

Obligitory Ham Story (since this is rec.radio.amateur.misc)... when
I was a little tyke, (a bit older, say 6), my neighbor next door was
a ham (Archie, W5LBL... I DO remember that one)... and he let me talk
on his radio a couple of times... I thought that was incredibly NEAT,
and wanted to do it later in life.   Don't neglect to let kids
experience the wonder of talking across the world (or across the room);
they are the future hams.

73s

Bill KM6KV

Date: Thu, 25 Mar 1993 16:02:15 GMT
From: noc.near.net!lynx!lkay@uunet.uu.net
Subject: Kenwood cw filter (and incorrect offset)
To: info-hams@ucsd.edu

In article <1993Mar24.212916.14685@cbnewsl.cb.att.com>,
  dara@cbnewsl.cb.att.com (s.b.darack) writes:

> I recently tried to verify the offset of my Kenwood TS440S in cw mode and
> also examine the shape of my 500 Hz filter. I did this by tuning to a
> local am broadcast station's listed frequency and placed a frequency counter
> across the headphone jack while in cw mode using the narrow filter. Sure
> enough, the audio tone was at 800 Hz, just like the manual claimed. Then
> I used the s meter (with the rigs attenuator switched in) to plot out
> signal strength vrs offset. That gave me a nice curve with one surprise:
> the center of the passband was around 1 KHz! At 800 Hz there was noticable
> loss. I had been wondering why cw sigs got a little weaker once we started
>
> Anyone care to comment, verify my results, or... ?
> 73 Shel WA2UBK dara@physics.att.com

WOW! Shel, I have the *exact* same problem on my TS-820S. I bought it used,
so I always thought it was something that drifted out of alignment that
I would fix the next time I put it on the bench and tuned it up. But I'm
not sure now! Another example of the classic scenario where you think you're
the only one in the world with your problem :-(.....

Anyway, I too noticed the symptoms you describe, and I also plotted out
the passband skirt via the S-meter, and I too found that my passband
center is roughly 1000 Hz. (and my audio tone/offset is 800).

What I do to deal with it: I leave my IF Shift control slightly off the
center detent to correct it - roughly the 200 Hz's worth.

Shel (and anyone else with similar Kenwood problem) , you might
tell me if you notice the problem on SSB also (I do) - i.e. if you
don't play with the IF Shift, and you tune to a dead band, is the
pitch of the band hiss the same on USB and LSB? On my rig the
pitch seems to be off by the same 200Hz, and again it's fine if
I twiddle the IF shift as for CW.

Looking through my 820 Service Manual, it seems this is a problem
with the `carrier adjust' circuitry. I will try to tweak it during
the above mentioned tune up, which I should do soon.

Is this a generic Kenwood thing? Are there any other readers with
other Kenwood models that do this?

Len


```
-------------------------------------------------------------------------
 Dr. Leonard Kay, KB2R                | "But we are not dealing with the
 Electrical and Computer Engineering |  normal world. We are chasing DX."
 Northeastern University, Boston      |    -- W9KNI, 'The Complete DXer'
 NU ARC: W1KBN 145.31(-)              |
 Packet: KB2R@K1EA                    | #include <disclaimer.h>
-------------------------------------------------------------------------
```

In rec.radio.amateur.misc, gary@ke4zv.uucp (Gary Coffman) writes:
>In article <1264@arrl.org> zlau@arrl.org (Zack Lau) writes:
>>In rec.radio.amateur.misc, gary@ke4zv.uucp (Gary Coffman) writes:
>>>*pack* fully is a tricky process because the weaker cells will discharge
>>>first and begin to *reverse* charge. This will almost surely damage the
>>>cells. The *correct* way is to take the pack apart and discharge each
>>>cell *individually*. Since this is a pain, you want to avoid having
>>>to deep discharge your battery as a routine practice.

```
>>
>>Why can't you just monitor the voltage on each cell instead of taking
>>the battery apart?  You then stop discharging as soon as any of the
>>cells reaches the desired voltage.  This is why voltmeters are such
>>handy devices--you can often test circuits without taking connections
>>apart.
>
>Funny thing about voltmeters Zack, they don't work too well through
>plastic. That's why God invented screwdrivers. You gotta open the
>pack to get to the cell terminals anyway, you might as well clip
>a resistor load across each cell and do the job right. That way
>you can safely take each cell all the way down to zero voltage.

Depends whether you want a "one shot" or permanent solution.
I was thinking along the lines of using resistors to safely bring
out the leads, so that you could easily monitor the pack's
condition (at least tell when a cell is about to be reverse
charged).  Actually, what would be nice is a dedicated IC--one
pin to each terminal plus one for battery output and maybe another
for a logic ouput.  The IC would disconnect the pack and prevent the
cells from reverse charging.  Some pins might be required for
programming the number of cells.

BTW I should have realized the only battery packs of concern
to amateurs are those that are attached to HTs :-).  I think
the Microsats actually monitor each cell's voltage, but not with
8 separate voltmeters. :-).

Zack Lau  KH6CP/1

Internet: zlau@arrl.org             "Working" on 24 GHz SSB/CW gear
                        Operating Interests: 10 GHz CW/SSB/FM
US Mail: c/o ARRL Lab                     80/40/20 CW
    225 Main Street        Station capability: QRP, 1.8 MHz to 10 GHz
    Newington CT  06111                  modes: CW/SSB/FM/packet
                                amtor/baudot
Phone (if you really have to): 203-666-1541
```

> Let's not forget that the Technician class license is a valid license in
> and of itself!

Oohrah!!! Well said. I only meant that if someone truely feels code is
necessary, then they, too, cannot come down too hard on Techs, because there are
many people I know (myself included) who are just planning to use the Tech
license to get their foot in the door, so to speak. In this regard, it is much
like the original Novice class license, which was only good for one year and
could not be renewed. (You had to get General, and later Tech.)

> The FCC will allow a Tech to remain a Tech forever, with
> or without code. The decision of a licensee to upgrade or not, to learn
> the code or not, is a personal decision that is none of the rest of
> hamdom's direct business.

And, I truely respect that decision.

>
> A Technician that chooses not to upgrade -- ever -- is still a ham that
> in my book is as much a part of the Amateur Radio service as the fastest
> CW operator that ever lived (a new thread?). Let us help the hobby we
> care so much about by making sure the Technician is bade the same
> warm welcome that we once expected when we first cast our signal skyward.

I agree whole-heartedly!!! (And a lot of
the *really* old hams do to, such as my grandfather who was first licensed in
1931. I guess they have seen some many changes that it doesn't bother them any
more, and they more or less accept it.)

>
> 73 from ARRL HQ, Ed

73 and cul, Will, N0RDV/AA

--
Will Turner, N0RDV/AA   --
wjturner@iastate.edu | "Are you going to have any professionalism, |
twp77@isuvax.iastate.edu | or am I going to have to beat it into you?" |
TURNERW@vaxld.ameslab.gov   --

Date: 25 Mar 1993 16:43:14 GMT
From: sdd.hp.com!col.hp.com!bobw@network.UCSD.EDU
Subject: RFD: reorganization of rec.radio.amateur
To: info-hams@ucsd.edu

>This request for discussion is the beginning of the newsgroup creation process
>outlined in GUIDELINES FOR NEWSGROUP CREATION, which can be found in
>news.groups. Because of the high volume of traffic in rec.radio.amateur.misc,
>a mail list was created (with an open invitation posted to the newsgroup) to
>discuss the issue. This RFD is in response to two problems that were
>identified by the mail list.
>1) rec.radio.amateur.misc has a daily traffic volume which is too high for most
>   people to follow on a regular basis.
  I agree with this and thank the group for an attempt to make this a
  better world.

>2) rec.radio.amateur.packet needs to be renamed due to the growth of other
>   digital modes besides packet on amateur radio.
>
  This is less obvious to me, but I don't follow r.r.a.packet very closely.
  I just notice that this group does not 'overflow' on the big disk in the
  sky very quickly.

The central question seems to be whether anyone will use these new groups
without lots of cross-posting to r.r.a.misc. [Stating the obvious...] Its
real helpful if the people who post on a particular topic are motivated
to get it posted to the right group. For example, one of the problems with
the endless "no-code sucks" discussion is that various people are motivated
to post in r.r.a.misc because its more fun that way. (Still, I think
r.r.a.policy was a good addition for people who REALLY want to discuss,not
just flame.)

A well-functioning news group in some sense represents a community that
shares common interests, experiences, etc. I would suggest that r.r.a.packet
tends to work fairly well (i.e. attracts most packet-related postings)
because of this.

>The proposed reorganization of rec.radio.amateur would result in the following
>groups: [all the following proposed groups are unmoderated]
>
>Newsgroup name   description
>--------------   -------------------------------
>rec.radio.amateur.misc   all Ham radio topics not covered below
>   i.e. video, stories, humor, new topics
>   [no modification to existing newsgroup]
  Potpourri of r.r.a

```
>rec.radio.amateur.policy        regulations & policy issues
>                        [no modification to existing newsgroup]
  Previous comments apply.

>rec.radio.amateur.digital.misc    packet radio & other digital modes
>                        [includes old rec.radio.amateur.packet]
>rec.radio.amateur.digital.tcp-ip    TCP/IP via packet radio
  Maybe if I was a tcp-ip enthusiest this would seem like a good idea.

>rec.radio.amateur.operating        Operating procedures and questions: DX,
>                    CW, contests, propagation, repeaters
  All of this stuff will tend to end up in r.r.a.misc without a moderator.

>rec.radio.amateur.products      manufactured equipment, modifications
  Ditto
>rec.radio.amateur.instruction        Ham radio instruction & examination
  Is this big enough to worry about?

>rec.radio.amateur.construction        homebrewing & experimentation
  This might work because the homebrew/technoid posters will be motivated
  to leave the r.r.a.misc quagmire. Probably passes the "community" test.
  Is this really r.r.a.technical ?

>rec.radio.amateur.space            amateur radio in space: satellites,
>                    earth-moon-earth (EME), shuttle, MIR
  This would work, definitely passes the community test.

>rec.radio.amateur.emerg-services    emergency services: RACES, ARES, NTS
  Is this big enough to bother with?
>
>An alternate proposal, aimed at having fewer newsgroups, found some support in
>the reorganization mail list.  It is presented here as a potential alternative
>for use in the discussion, as a guage of which one the rec.radio.amateur
>community prefers.  It amends the proposal as follows:
>
>Newsgroup name                description
>--------------                -------------------------------
>rec.radio.amateur.tech        Technical discussions about Ham Radio:
>                    construction, satellites, theory,
>                    examinations, video, repeaters
>                    [unmoderated]
>[this replaces r.r.a.instruction, r.r.a.construction, and r.r.a.space, plus
>taking all technical topics from r.r.a.misc]
>
  This seems pretty good but r.r.a.space still deserves
  a separate spot because it represents a different "community".
  I am assuming that the space/keplerian/amsat bulletins show up
  wherever r.r.a.space content is supposed to be.
```

Also, its not obvious to me that r.r.a.instruction fits in here.

 Bob Witte / HP Colo Springs / bobw@col.hp.com   / KB0CY

Date: Thu, 25 Mar 1993 14:22:57 GMT
From: pacbell.com!att-out!cbfsb!cbnewsb.cb.att.com!feg@network.UCSD.EDU
To: info-hams@ucsd.edu

References <1993Mar23.135145.20978@cbfsb.cb.att.com>,
<1993Mar24.130705.17235@magnus.acs.ohio-state.edu>,
<1993Mar25.000101.9350@ke4zv.uucp>
Subject : Re: source for spools of wire

In article <1993Mar25.000101.9350@ke4zv.uucp> gary@ke4zv.UUCP (Gary Coffman)
writes:
>In article <1993Mar24.130705.17235@magnus.acs.ohio-state.edu>
wvanhorn@magnus.acs.ohio-state.edu (William E Van Horne) writes:
>>
>>know. But it seems to me that the question of using steel
>>wire in antennas must depends upon (1) the frequency to be
>>used and, (2) the radiation resistance of the antenna.
>>Clearly the skin effect is a function of frequency and at
>>long wavelengths, at which very long antennas are of most
>>interest, it is far less than at high frequencies. Also, if
>>one is building a rhombic, for example, the radiation
>>resistance will be up in the neighborhood of 800 ohms. Even
>>steel wire is a pretty good conductor compared with that.
>
>Skin effect predominates above VLF. The practical difference
>at MF, HF, and VHF is nil. You're right that steel isn't
>*that* resistive however.
>
>>About 50 years ago, either just before or just after WW2,
>>QST had an article which I seem to remember was titled
>>something like: "Iron Antennas for Copper Filled
>>Pocketbooks". The author reported excellent results with
>>steel (galvanized?) fence wire in antennas. A search of
>>old QST files might give specific answers rather than
>>unsupported opinions about this subject.
>
>tower blew down (a *galvanized steel* transmitting tower).
>non-directional AM station, we had a bad storm and the
>To get us back on the air quickly, I loaded the transmitter
>into the top barb wire of the perimeter fence. The phone rang

> The moral of this story is that galvanized wire *works*
>as a transmitting antenna.
>

In all of this discussion I believe I made clear that so long
as steel wire is zinc coated (galvanized) it is a fairly good
RF conductor. The same goes for copper coated steel (although
commercial Copperweld wire has a much thicker coating of
copper). The problem with steel is that due to its being a
magnetic material it has practically no RF conductivity
on its skin. And yes, these effects are related to frequency;
the higher it is, the worse steel gets.

Some years past, I built a 40 Meter 4-square vertical array
using galvanized steel fence wire for the radial system.
It was my first large scale use of fence wire and I had
no suspicions of what I was in for.

After laying down 120 radials for each vertical I measured
each self-impedance and sure enough, appprox. 37 ohms each.
The array worked just fine. But as time went on and a
year went by the VSWR of this array steadily got worse
and the F/B went to hell in a hand basket.

So, out with the R-X measuring equipment. Each vertical
was reading in the area of 80 to 100 ohms. This is about
what you get with *one* radial on a quarter wave length
vertical. All of the radial system was heavily coated
with rust; no vestige of zinc could be found.

At 7MHz this array was operating with the equivalent of
one radial apiece for the verticals. It still "worked"
but it had no visible F/B ratio (as should be expected
for a driving network that had been based upon much
different self and mutual impedances).

That's my war story and why I inveigh against the use
of steel for HF antennas. I am not saying steel
will never work--of course it does--you can hang
a bedspring at 100 feet for an antenna and it will
"work". But once deciding to put a lot of effort into
an antenna, go the distance and do it right, especially
if you expect to use it for a year or more.

Forrest Gehrke feg@dodger.att.com k2bt

Date: Thu, 25 Mar 1993 15:08:50 GMT
From: orca!javelin.sim.es.com!datwyler@uunet.uu.net
To: info-hams@ucsd.edu

References <1993Mar24.165356.28468@mlb.semi.harris.com>,
<C4EqF2.MDy@javelin.sim.es.com>, <1993Mar24.234051.9186@ke4zv.uucp>
Reply-To : datwyler@javelin.sim.es.com
Subject : Re: Offset to UTC calculation?

gary@ke4zv.uucp (Gary Coffman) writes:

>In article <C4EqF2.MDy@javelin.sim.es.com> datwyler@javelin.sim.es.com writes:
>>Just a note.
>>
>>Arizona, one of Utah's neighbors, does not have daylight savings time.
>>During the winter, it is the same as MST at UTC - 7 hrs. During the
>>summer, it is same as PDT - 7 hours.
>
>I'm sooooo confused. :-)
>
>Gary
>--
>Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
>Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
>534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
>Lawrenceville, GA 30244 | |

It is always MST - 7 hrs. Boy, what the stress at work can do.

--
Douglas L. Datwyler, WR7O |Q. How many Heisenbergs does it take
Evans & Sutherland Computer Corp. | to screw in a light bulb?
preferred e-mail: |A. If you know the number, you don't
datwyler@moons.sim.es.com | know where the light bulb is!

End of Info-Hams Digest V93 #376
****